The following supplement accompanies the article

Habitat use patterns and edge effects across a seagrass-unvegetated ecotone depend on species-specific behaviors and sampling methods

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Methods and results – Structural associations of mesopredators in video samples

Data collection and analysis. For each of the 50 video samples collected in our study, fish and crustaceans observed within the 1 m^2 pyramid base were tallied by species and those primarily seen within 10 cm of the PVC structure were tallied separately, collectively forming a total of 81 assemblages, 31 of which were PVC-associated. To test differences in PVC-association across habitats, we calculated the fraction of mesopredator individuals that were PVC-associated in each video set. These fractions were used as the response variable in a generalized linear mixed effects model (glmm; binomial error, logit link), with fixed effects of habitat, water height, and their interaction, and site and subsite as nested random effects. Significance of fixed effects was determined by likelihood ratio tests comparing models with and without each main effect and the interaction.

Then, relative contributions of our focal taxa to sample assemblages were also compared between "free" and PVC-associated assemblages using Wilcoxon signed-rank tests, which test pairwise differences in taxon contributions to equivalent "free" and PVC-associated assemblages (62 assemblages or 31 pairs out of the total 81 separate assemblages). Finally, we conducted a subsite-stratified PERMANOVA (9,999 permutations) on relative contributions of individuals to "free" and PVC-associated assemblages to determine how community structure differed according to PVC association, habitat, and their interaction, and visualized the assemblages using a non-metric multidimensional scaling (NMDS) plot.

Results. Across habitats, the greatest proportion of PVC-associated individuals was present in unvegetated areas, with the proportion decreasing from edge into interior (χ^2_2 = 40.72, $p < 0.0001$, Fig. S1); there were no significant water height or interaction effects. Multivariate analyses showed a significant effect of PVC association and habitat on mesopredator assemblages in videos (PVC association pseudo-$F_{1,75}$ = 14.66, $p < 0.001$; habitat pseudo-$F_{2,75}$ = 1.47, $p = 0.032$; Table S1, Fig. S2). Taxa disproportionately associated with PVC included staghorn sculpins and crabs in the genus *Metacarcinus* (staghorn sculpin $p = 0.034$, *Metacarcinus* $p = 0.023$); shiner perch and flatfishes appeared to avoid PVC structure (shiner perch $p < 0.0001$, flatfishes $p = 0.00050$; Fig. S3)

Overall, videos showed that mesopredators can react strongly at small spatial scales to structures added by humans to tideflats. While we assumed that assemblages greater than 10 cm into the center of the base were free from any effects of the PVC structure, these effects are difficult to account for. Possible effects could be predation refuge (Huang et al. 2015), refuge from strong currents (especially in unvegetated areas, where PVC-associated assemblages were found to be larger), or others.

Table S1. Results of PERMANOVA assessing the effects of PVC association, habitat, and their interaction on relative numbers of mesopredators observed in videos. Bolded p values represent significance at an α-level of 0.05.

	Df	SS	MS	Pseudo-F	R^2	p
Association	1	3.66	3.66	14.66	0.16	**< 0.001**
Habitat	2	0.73	0.37	1.47	0.031	**0.032**
Interaction	2	0.36	0.18	0.72	0.015	0.53
Residuals	75	18.72	0.25	0.80		
Total	80	23.47	1			

Table S2. Relative abundances of the six focal taxa observed in both seines and videos, including the results from Wilcoxon signed-rank tests of relative abundances by method. Bolded p values represent significance at an α-level of 0.05.

Species	Relative Abundance		V	p
	Seine	Video		
Shiner perch	0.25 ± 0.060	0.41 ± 0.045	23	**< 0.001**
Stickleback	0.25 ± 0.049	0.066 ± 0.017	54	**0.003**
Staghorn sculpin	0.10 ± 0.029	0.22 ± 0.028	247	**< 0.001**
Flatfishes	0.041 ± 0.010	0.083 ± 0.020	133	0.44
Gunnels	0.081 ± 0.024	0.061 ± 0.013	176	0.11
Metacarcinus spp.	0.031 ± 0.015	0.079 ± 0.024	57	**0.014**
Total	0.74 ± 0.045	0.92 ± 0.019		

Table S3. Results of post-hoc tests of abundances in video samples. Bolded p values represent significance at a Bonferroni-corrected α-level of 0.017.

Species	Average abundance		χ^2_1	p
	Unvegetated	Edge		
All	21.19 ± 4.68	34.63 ± 2.91	31.54	**< 0.001**
Shiner perch	5.25 ± 1.55	12.56 ± 2.70	11.63	**< 0.001**
Stickleback	0.38 ± 0.31	1.0 ± 0.48	1.57	0.21
Flatfishes	3.81 ± 1.22	2.69 ± 0.74	1.54	0.21
	Unvegetated	Interior		
All	21.19 ± 4.68	21.28 ± 2.35	0.33	0.57
Shiner perch	5.25 ± 1.55	8.61 ± 1.13	10.69	**0.001**
Stickleback	0.38 ± 0.31	3.50 ± 1.10	7.72	**0.006**
Flatfishes	3.81 ± 1.22	0.39 ± 0.20	17.08	**< 0.001**
	Edge	Interior		
All	34.63 ± 2.91	21.28 ± 2.35	41.443	**< 0.001**
Shiner perch	12.56 ± 2.70	8.61 ± 1.13	0.641	0.42
Stickleback	1.0 ± 0.48	3.50 ± 1.10	4.7897	0.029
Flatfishes	2.69 ± 0.74	0.39 ± 0.20	14.311	**<0.001**

Table S4. Results of post-hoc tests of abundances in seine samples. Bolded p values represent significance at a Bonferroni-corrected α-level of 0.017.

Species	Average abundance		χ^2_1	p
	Unvegetated	Edge		
All	76.78 ± 25.77	375.22 ± 129.62	12.40	**< 0.001**
Shiner perch	6.33 ± 2.98	198.56 ± 121.48	7.39	**0.007**
Stickleback	6.11 ± 4.06	71.22 ± 18.89	18.024	**< 0.001**
Gunnels	15.67 ± 11.38	20.11 ± 9.19	3.35	0.067
	Unvegetated	Interior		
All	76.78 ± 25.77	649.78 ± 125.42	25.33	**< 0.001**
Shiner perch	6.33 ± 2.98	254.89 ± 125.47	20.88	**< 0.001**
Stickleback	6.11 ± 4.06	254.00 ± 107.54	18.27	**< 0.001**
Gunnels	15.67 ± 11.38	35.00 ± 19.40	6.76	**0.009**
	Edge	Interior		
All	375.22 ± 129.62	649.78 ± 125.42	7.68	**0.006**
Shiner perch	198.56 ± 121.48	254.89 ± 125.47	5.81	**0.016**
Stickleback	71.22 ± 18.89	254.00 ± 107.54	4.37	0.037
Gunnels	20.11 ± 9.19	35.00 ± 19.40	0.40	0.53

Table S5. Results of nonparametric analyses of time in view (TiV) for mesopredators observed in videos. Bolded p values represent significance at $\alpha = 0.05$.

Species	Time in View			χ^2_2	p
	Unvegetated	Edge	Interior		
Shiner perch	10.16 ± 1.78	16.31 ± 1.79	18.37 ± 1.84	16.17	**< 0.001**
Stickleback	2.83 ± 0.48	25.14 ± 5.71	33.61 ± 4.63	10.71	**0.005**
Staghorn sculpin	40.77 ± 3.31	28.29 ± 2.43	39.71 ± 4.61	4.38	0.11
Flatfishes	57.07 ± 4.00	55.66 ± 7.37	61.29 ± 17.17	0.76	0.69
Gunnels	55.40 ± 10.43	56.10 ± 8.39	61.57 ± 10.13	0.38	0.83
Metacarcinus spp.	63.73 ± 12.56	63.67 ± 8.25	97.93 ± 8.30	5.45	0.066

Table S6. Results of PERMANOVA analyses of mesopredator feeding behavior in videos. Bolded p values represent significance at $\alpha = 0.05$.

Species	Non-zero feeding events per second			PERMANOVA		
	Unvegetated	Edge	Interior	Pseudo-F	Residual df	p
Shiner perch	0.15 ± 0.015	0.16 ± 0.014	0.11 ± 0.009	1.81	367	0.17
Stickleback	0	0.042 ± 0.027	0.069 ± 0.008	3.84	78	**0.027**
Staghorn sculpin	0.043 ± 0.010	0.034 ± 0.005	0.085 ± 0.038	3.20	333	**0.026**
Flatfishes	0.037 ± 0.003	0.030 ± 0.005	0.029 ± 0.012	2.87	100	0.060
Gunnels	0.021 ± 0.007	0.043 ± 0.019	0.021 ± 0.008	0.30	77	0.76
Metacarcinus spp.	0.017 ± 0.003	0.012 ± 0.003	0.014 ± 0.004	1.36	50	0.28

Table S7. Results of post-hoc tests of mesopredator Time in View (TiV) in video samples. Bolded p values represent significance at a Bonferroni-corrected α-level of 0.017.

Unvegetated/Edge	χ^2_1	*p*
Shiner perch	6.72	**0.010**
Stickleback	5.39	0.020
Unvegetated/Interior	χ^2_1	*p*
Shiner perch	15.70	**< 0.001**
Stickleback	11.18	**< 0.001**
Edge/Interior	χ^2_1	*p*
Shiner perch	3.85	0.050
Stickleback	0.11	0.74

Table S8. Results of post-hoc PERMANOVAs of mesopredator feeding rates in video samples. Bolded p values represent significance at a Bonferroni-corrected α-level of 0.017.

Unvegetated/Edge	*Pseudo-F*	*Residual df*	*p*
Staghorn sculpin	0.72	267	0.44
Stickleback	N/A	N/A	N/A
Unvegetated/Interior	*Pseudo-F*	*Residual df*	*p*
Staghorn sculpin	2.77	199	0.077
Stickleback	N/A	N/A	N/A
Edge/Interior	*Pseudo-F*	*Residual df*	*p*
Staghorn sculpin	4.29	200	0.036
Stickleback	3.84	78	0.027

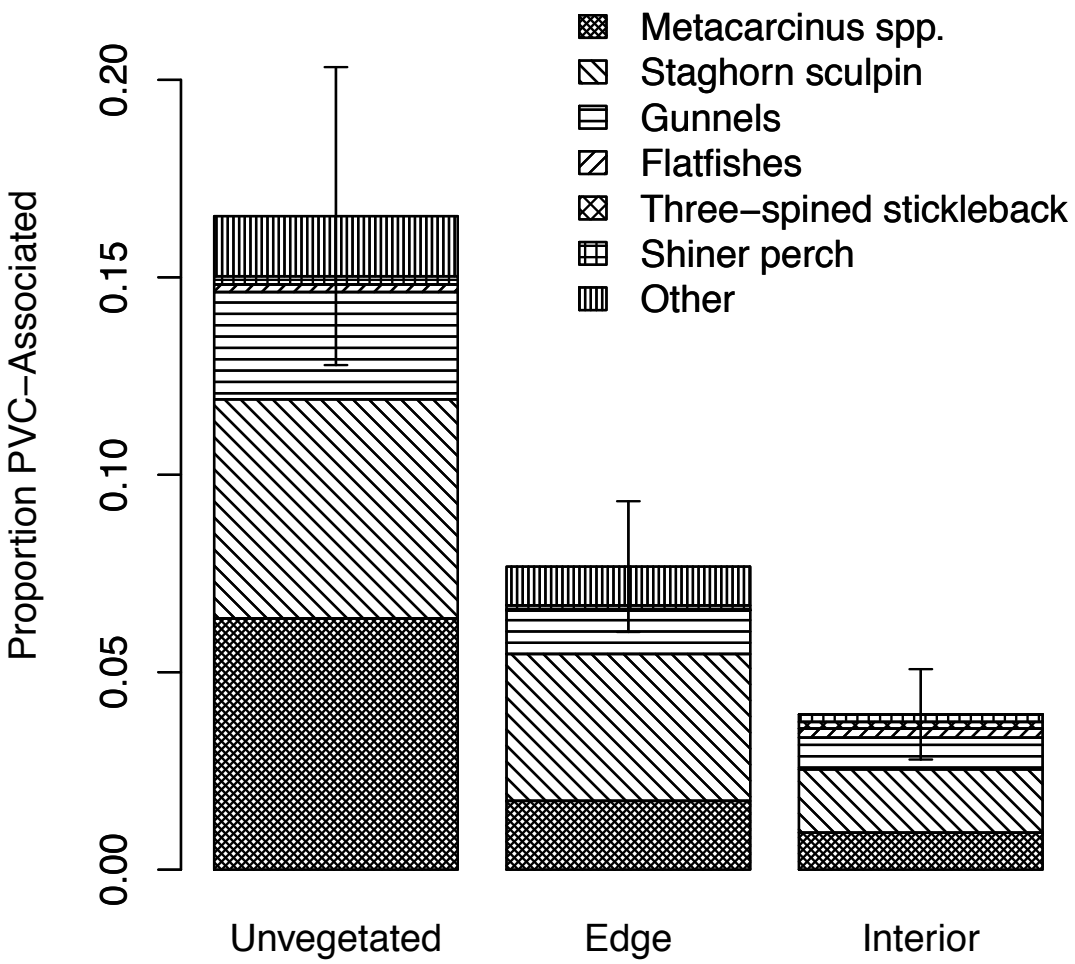

Figure S1. PVC-associated mesopredator assemblages in videos displayed as the proportion of the total assemblage seen within 10 cm of the PVC camera support structure, subdivided to show the proportional contributions of focal taxa. Error bars represent standard error of the total proportion, based on 16 video samples for unvegetated and edge habitats, and 18 video samples for interior.

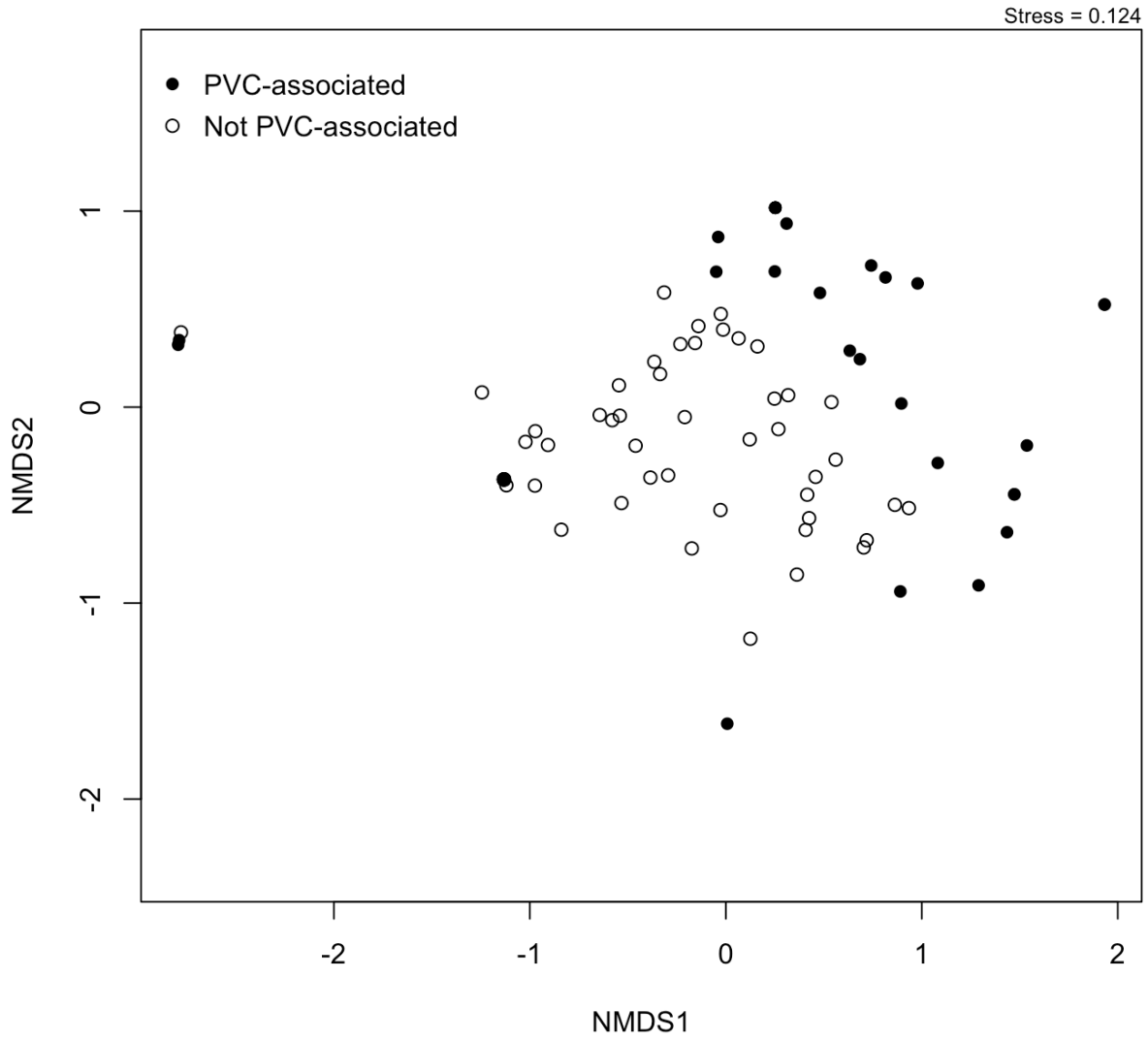

Figure S2. Non-metric multidimensional scaling (NMDS) plot of species assemblages in videos both in association with and free from the PVC camera support structure.

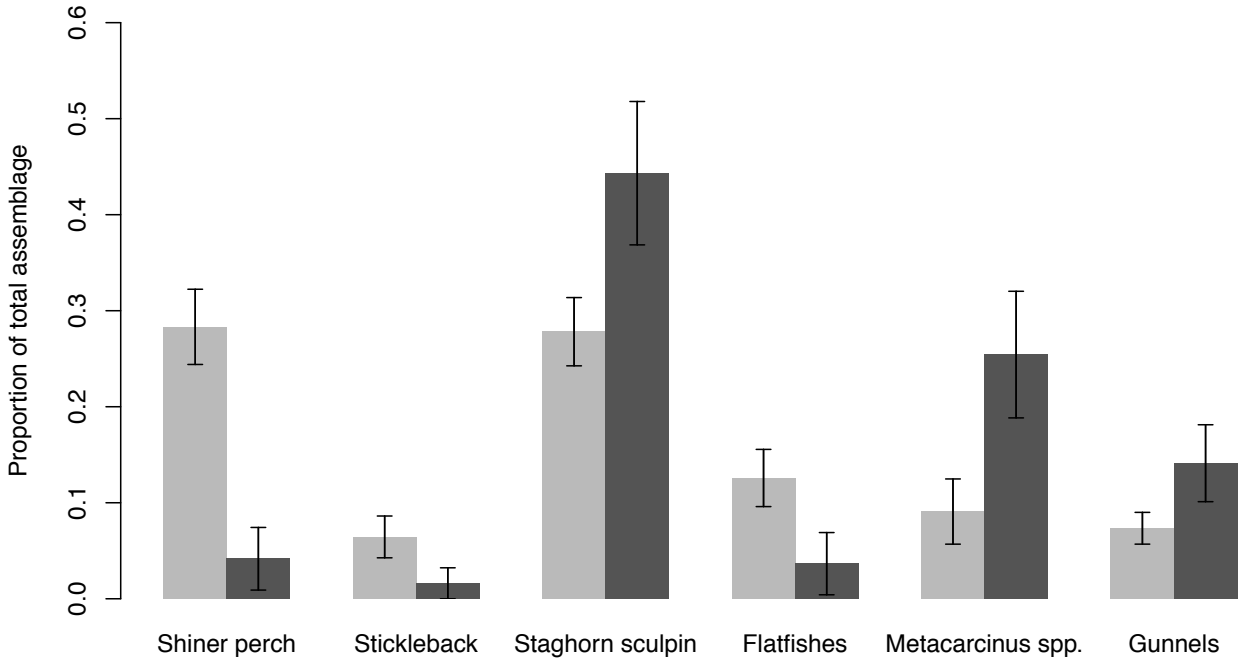

Figure S3. Relative contributions of six focal taxa to free (light grey bars) and PVC (dark grey) assemblages in videos, pooled across sites, habitats, and water levels. Stars indicate significant pairwise differences at $\alpha = 0.05$ based on Wilcoxon signed-rank tests.